

WHAT IS CLAIMED IS:

1 1. An isolated nucleic acid encoding an estrogen-regulated
2 unconventional myosin-related protein, said protein having at least one of the following
3 characteristics:

4 (1) comprising at least about 70% amino acid sequence similarity to a
5 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6; or

6 (2) specifically binding to polyclonal antibodies generated against a
7 polypeptide comprising an amino acid sequence selected from the group consisting of
8 SEQ ID NOs: 1, 4 and 6.

1 2. The nucleic acid of claim 1, wherein said protein is at least about
2 70% identical to a sequence selected from the group consisting of SEQ ID NOs: 1, 4, and
3 6.

1 3. The nucleic acid of claim 1, wherein said nucleic acid encodes a
2 protein comprising an amino acid sequence selected from the group consisting of SEQ ID
3 NOs: 1, 4 and 6.

1 4. The nucleic acid of claim 1, wherein said nucleic acid comprises a
2 nucleotide sequence that is at least about 70% similar to a sequence selected from the
3 group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1 5. The nucleic acid of claim 4, wherein said nucleic acid comprises a
2 nucleotide sequence that is at least about 70% identical to a sequence selected from the
3 group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1 6. The nucleic acid of claim 4, wherein said nucleic acid comprises a
2 nucleotide sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1 7. The nucleic acid of claim 1, wherein said nucleic acid hybridizes
2 under moderately stringent wash conditions to a nucleic acid comprising a nucleotide
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1 8. The nucleic acid of claim 7, wherein said nucleic acid hybridizes
2 under stringent wash conditions to a nucleic acid comprising a nucleotide sequence
3 selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

- 1 9. The nucleic acid of claim 1, wherein said nucleic acid is from a
2 mouse.
- 1 10. An expression cassette comprising the nucleic acid of claim 1.
- 1 11. An isolated eukaryotic cell comprising the expression cassette of
2 claim 10.
- 1 12. An isolated estrogen-regulated unconventional myosin-related
2 protein, said protein having at least one of the following characteristics:
3 (1) comprising at least about 70% amino acid sequence similarity to a
4 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6; or
5 (2) specifically binding to polyclonal antibodies generated against a
6 polypeptide comprising an amino acid sequence selected from the group consisting of
7 SEQ ID NOs: 1, 4 and 6.
- 1 13. The protein of claim 12, wherein said protein comprises at least
2 about 70% amino acid sequence identity to a sequence selected from the group consisting
3 of SEQ ID NOs: 1, 4 and 6.
- 1 14. The protein of claim 12, wherein said protein comprises an amino
2 acid sequence selected from the group consisting of SEQ ID NOs: 1, 4 and 6.
- 1 15. The protein of claim 12, wherein said protein is from a mouse or a
2 human.
- 1 16. An antibody that selectively binds to the estrogen-regulated
2 unconventional myosin-related protein of claim 12.
- 1 17. A method of modulating the effects of estrogen in a mammalian
2 cell, said method comprising modulating the level of expression or activity of the
3 estrogen-regulated unconventional myosin-related protein of claim 12 in said cell.
- 1 18. The method of claim 17, wherein said level of expression of said
2 estrogen-regulated unconventional myosin-related protein is modulated by introducing a
3 polynucleotide into said cell, whereby the presence or expression of said polynucleotide

4 modulates said level of expression of said estrogen-regulated unconventional myosin-
5 related protein.

1 19. The method of claim 18, wherein said polynucleotide encodes a
2 full-length estrogen-regulated unconventional myosin-related protein of claim 12, and
3 wherein expression of said polynucleotide increases said level of expression of said
4 estrogen-regulated unconventional myosin-related protein.

1 20. The method of claim 18, wherein said polynucleotide is an
2 antisense sequence, and wherein the presence or expression of said polynucleotide
3 decreases said level of expression of said estrogen-regulated unconventional myosin-
4 related protein.

1 21. The method of claim 17, wherein a compound is administered to
2 said cell, whereby said level of said expression or activity of said estrogen-regulated
3 unconventional myosin-related protein is modulated.

1 22. The method of claim 17, wherein said effects of estrogen are
2 mediated by an estrogen receptor α .

1 23. The method of claim 17, wherein said effects of estrogen are
2 mediated by an estrogen receptor β .

1 24. The method of claim 17, wherein said cell is present in a mammal.

1 25. The method of claim 24, wherein said level of expression or
2 activity of said estrogen-regulated unconventional myosin-related protein is increased,
3 whereby the development of atherosclerosis or osteoporosis in said mammal is inhibited.

1 26. The method of claim 24, wherein said level of expression or
2 activity of said estrogen-regulated unconventional myosin-related protein is decreased,
3 whereby the development of breast cancer in said mammal is inhibited.

1 27. A method of detecting the presence of estrogen signaling in a
2 mammalian cell, the method comprising detecting the expression of the nucleic acid of
3 claim 1 in the cell.

1 28. The method of claim 27, wherein said presence of estrogen
2 signaling in said cell is used in order to determine the responsiveness of said cell to
3 estrogen.

1 29. The method of claim 27, wherein said presence of estrogen
2 signaling in said cell is used in order to determine the tissue-specific distribution of
3 estrogen signaling in a mammal.

1 30. The method of claim 27, wherein said estrogen signaling is
2 mediated by an estrogen receptor α .

1 31. The method of claim 27, wherein said expression of said nucleic
2 acid in said cell is detected by detecting the expression or activity of the protein of claim
3 12 in said cell.

1 32. The method of claim 27, wherein said expression of said nucleic
2 acid in said cell is detected by detecting the level of estrogen-regulated unconventional
3 myosin mRNA in said cell.

1 33. A method of identifying a compound capable of acting as an
2 estrogen-receptor agonist or antagonist, the method comprising:

3 (1) contacting a cell comprising an estrogen receptor with said compound;
4 and

5 (2) detecting the functional effect of said compound on said cell,
6 wherein an increase in the level of estrogen regulated unconventional
7 myosin-related mRNA, protein, or protein activity in said cell indicates that said
8 compound is capable of acting as an estrogen receptor agonist, and wherein an decrease
9 in the level of estrogen regulated unconventional myosin-related mRNA, protein, or
10 protein activity in said cell indicates that said compound is capable of acting as an
11 estrogen receptor antagonist.

1 34. The method of claim 33, wherein said estrogen receptor is an
2 estrogen receptor α .

1 35. The method of claim 33, wherein said estrogen receptor is an
2 estrogen receptor β .

1 36. The method of claim 33, wherein said estrogen-regulated
2 unconventional myosin-related mRNA is at least about 70% similar to a nucleotide
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5, and 7.

1 37. The method of claim 36, wherein said estrogen-regulated
2 unconventional myosin-related mRNA is at least about 70% identical to a nucleotide
3 sequence selected from the group consisting of SEQ ID NOs: 2, 3, 5 and 7.

1 38. The method of claim 33, wherein said estrogen-regulated
2 unconventional myosin-related protein is at least about 70% similar to an amino acid
3 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6.

1 39. The method of claim 38, wherein said estrogen-regulated
2 unconventional myosin-related protein is at least about 70% identical to an amino acid
3 sequence selected from the group consisting of SEQ ID NOs: 1, 4, and 6.